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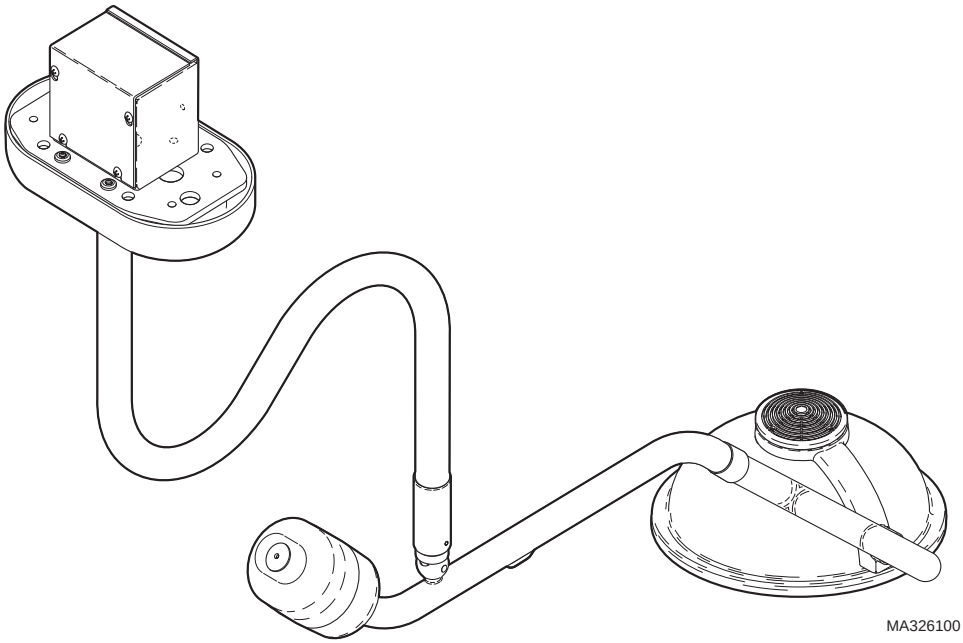
Operation Manual

355 Lighting System



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Owner's Product Identification

(information that you'll need to provide for servicing - key information is highlighted)

Date of Purchase	Serial Number
Name of Owner/Facility/Department	Model Number
Name of Authorized Dealer	Telephone # of Authorized Dealer
Address of Authorized Dealer	

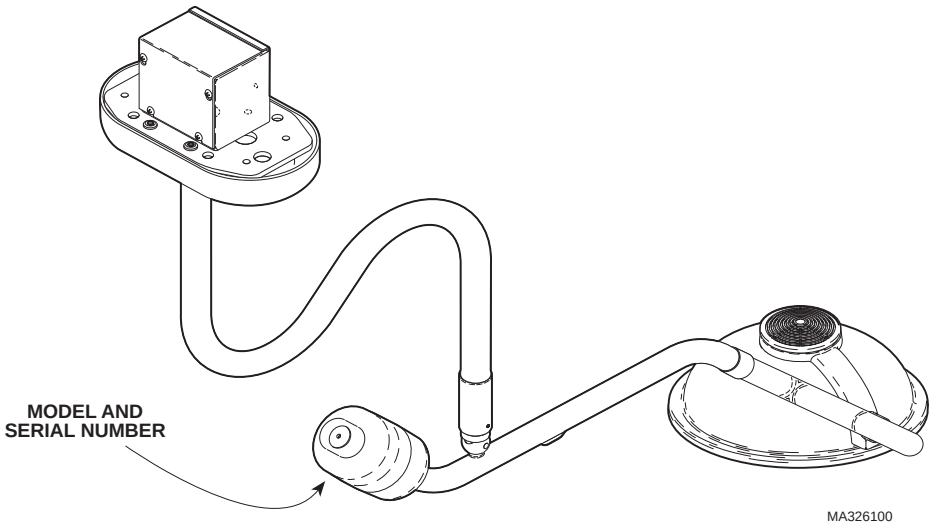

FIGURE 1. MODEL NUMBER / SERIAL NUMBER LOCATION

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SCOPE AND PURPOSE OF THIS MANUAL

This manual covers complete instructions for the operation of the 355 Lighting System and is intended to be used by medical personnel responsible for operating the 355 Lighting System during medical procedures or performing operator level maintenance. The installation manual is a separate document.

SAFETY INSTRUCTIONS

The primary concern of Midmark is that this equipment be operated and maintained with the safety of the users in mind. To assure safer and more reliable operation, read this manual before operating your equipment, assure that appropriate personnel are informed on the contents of this manual, be sure that you understand the instructions contained in this manual before attempting to operate this equipment, and keep this manual located near the equipment.

Explanation of Safety Symbols

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

EQUIPMENT ALERT

Indicates an imminently or potentially hazardous situation which, if not avoided, will or may result in serious, moderate, or minor equipment damage.

NOTE

Note is used to amplify an operating procedure, practice, or condition.

Safety Symbols in This Manual

Caution Signals

- Turn the on / standby switch to standby before replacing bulb. Otherwise, electrical shock or hand burns could result.
- Move the lighthead as far as possible from the exam/surgical site to prevent contaminants from falling onto the exam/surgical site. Do not try to remove the bulb until the unit is allowed to cool. Otherwise, burns to the hands and fingers could result.
- Use only quaternary/ammonia-based germicide to disinfect light. Staining, pitting, discoloration, or softening could occur if phenolic, iodophor, or glutaraldehyde-based disinfectant is used on plastic surfaces of the light. Also, use of alcohol or aerosol spray cleaner/disinfectant containing substantial amounts of alcohol in the formula can damage the faceplate.
- When cleaning or disinfecting the light, remove power from the light, allow optical unit to cool, and do not tough glass portion of bulb or inner components of lighthead with bare hand. Clean EXTERNAL SURFACES ONLY (arm assemblies and lighthead). Prevent fluids from leaking into interior or onto electrical contacts. DO NOT ATTEMPT to clean or disinfect interior; instead call an authorized dealer or service technician.

Equipment Alert Signals

- When cleaning or disinfecting the light, remove power from the light, allow optical unit to cool, and do not tough glass portion of bulb or inner components of lighthead with bare hand. Clean EXTERNAL SURFACES ONLY (arm assemblies and lighthead). Prevent fluids from leaking into interior or onto electrical contacts. DO NOT ATTEMPT to clean or disinfect interior; instead call an authorized dealer or service technician.

FEATURES

Lighthead

The 355 lighthead assembly is a fixed-focus, faceted reflector lighthead. The faceted reflector design of the lighthead provides excellent cavity penetration, while also controlling shadows from light-blocking objects. The design also results in bright, even distribution of light. The individual beams of light are arranged to provide an evenly illuminated 8 inch diameter beam at a distance of 36 inches. The peak illumination at 36 inches is at least 4,000 fc. The optical system filters out most of the infrared heat from the prefocused pattern of light. The plastic handle can be easily removed for sterilization or it accepts a Devon EZ Handle™ without requiring an awkward adapter. The lighthead is made with a color molded, lightweight polymer resulting in a very lightweight lighthead which is easy to position. The optical system is powered by a 12 VAC, 100 Watt bulb.

Arm Assemblies

The arm assemblies (suspension system) have been precisely designed, assembled, and balanced so that the lighthead can be positioned with minimal force and no drifting will occur. In addition, the three pivots with 540° of rotation make the positioning of the lighthead easy and flexible.

Safety Features

- The lighthead moves easily.
- The power supply has three output taps, allowing the voltage output to the light bulb to be adjusted according to the particular input voltage available at a facility. This prevents premature failure of the light bulb and lighthead components as well as unsatisfactory performance.

COMPONENTS OVERVIEW

	DESCRIPTION
1.	Down Tube Assembly
2.	Ceiling Plate
3.	Junction Box (includes transformer and fuse)
4.	Cross Tube Assembly
5.	Ballast Assembly
6.	Lamp Tube Assembly
7.	Lighthead Assembly
8.	Top Cap Assembly
9.	Support Arm Pivot Assembly
10.	Faceplate Assembly
11.	Ball Pivot Joint

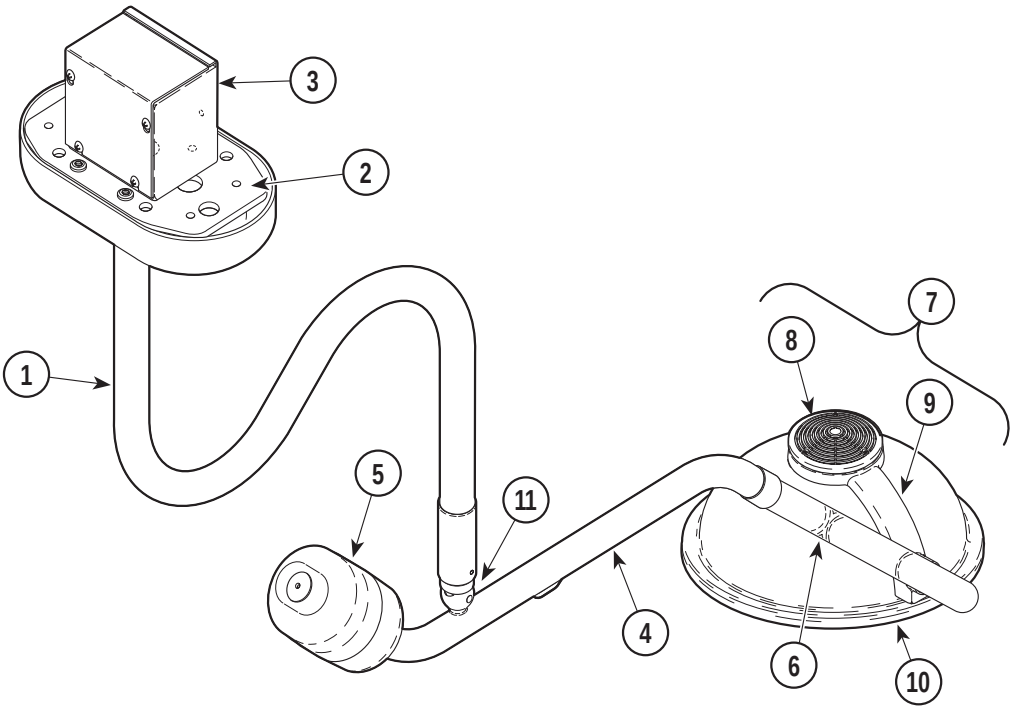

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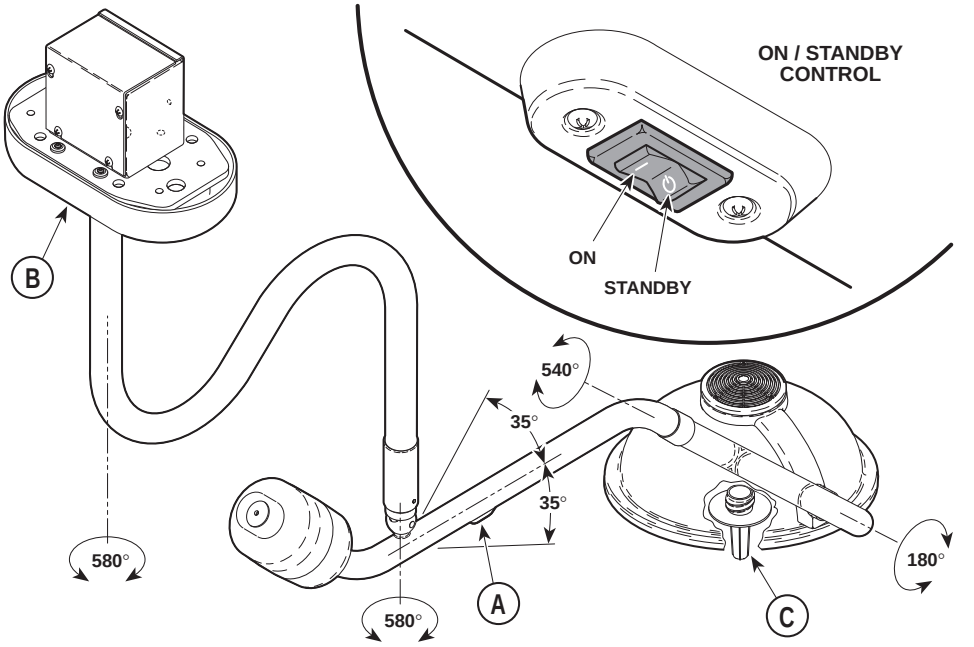
FIGURE 2. COMPONENTS OVERVIEW

CONTROLS AND INDICATORS

The on / standby control (See Figure 3) for the 355 Lighting System is located on the under side of the cross tube assembly. A replaceable fuse is located on the underside of the ceiling plate, under the ceiling cover (see fuse replacement procedure).



MA326300

FIGURE 3. CONTROLS AND INDICATORS

REF	CONTROL	FUNCTION
A	on / standby switch (indicated by international symbol for on / standby: I / ⏻)	*turns the light on or off.*
B	fuse holder	*can be removed and inspected to determine if fuse has been blown, indicating a current surge or problem with the light.*
C	sterilizable handle	*allows sterile personnel to move lighthead.*

OPERATION

Controls

Turn the lighthead on by switching the ON / STANDBY switch (I / ⏻) (A, Figure 3) to ON. To adjust the position of the lighthead, grasp the sterile handle (C) and rotate the arm assemblies and lighthead as necessary to obtain correct light penetration on the patient (See Figure 3 for amount of rotation for an axis). To turn off the lighthead, switch the ON / STANDBY switch (I / ⏻) to STANDBY.

OPERATOR TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
no light from lighthead	*lighthead is off*	turn on / standby switch to on
no light from lighthead; on / standby switch is on	*bulb has burned out*	refer to bulb replacement procedure in this manual
	fuse in junction box is blown	refer to the fuse replacement procedure in this manual
	no power to the junction box	call your building maintenance electrician to check for facility power to the junction box
	transformer is malfunctioning	call Midmark Technical Support: 1-800-Midmark
no light from lighthead although the bulb and fuse were checked; lighthead flashes intermittently when lighthead or arms are moved	*circuit or wiring problem within arm assemblies, junction box, or other part of lighting system*	call Midmark Technical Support: 1-800-Midmark
down tube, lamp tube, or lighthead does not rotate freely or drifts when released in desired position (see Figures 2 and 3)	*brakes need adjustment or improper installation of ceiling plate*	call Midmark Technical Support: 1-800-Midmark
cross tube rotates (at ball pivot joint) too stiffly or drifts when released in desired position (see Figures 2 and 3)	*tension needs to be adjusted or cross tube counterbalance needs to be adjusted*	refer to tension adjustment procedure in this manual. If proper tension cannot be achieved, call Midmark Technical Support: 1-800-Midmark

OPERATOR MAINTENANCE

Bulb Replacement Procedure

CAUTION

Turn the on / standby switch to standby before replacing bulb. Otherwise, electrical shock or hand burns could result.

CAUTION

Move the lighthead as far as possible from the exam/surgical site to prevent contaminants from falling onto the exam/surgical site. Do not try to remove the bulb until the unit is allowed to cool. Otherwise, burns to the hands and fingers could result.

1. Turn the on / standby switch (A, Figure 3) to standby. Move lighthead away from exam/surgical site. Lower the lighthead to gain access for bulb removal.

NOTE

Screws (1) are captive screws. Only loosen captive screws; do not try to remove them.

2. Loosen three captive screws (1, Figure 4) and separate top cap (2) from support arm pivot (3).
3. Allow the bulb (4) to cool (usually for several minutes). Grasp the bulb (4) and pull the bulb from bulb socket (5). Discard the old bulb while taking care not to break the glass capsule of the bulb.

NOTE

Halogen bulbs are sensitive to body oils. Be sure not to touch the glass portion of the bulb during relamping or cleaning. Body oils create a hot spot on the bulb and may cause the bulb to burn out prematurely. If the glass portion of the bulb is handled, wipe with a clean, soft, lint free cloth. Wipe with alcohol and pat dry.

4. Using a cotton glove or similar clean cloth, grasp a new bulb (4) and insert the new bulb into the bulb socket (5). Push the bulb in until its prongs bottom out; there should be approximately 1/16 in. [1.6 mm] gap between bulb socket and glass base of bulb. Forcing the bulb in further will cause damage.

NOTE

The top cap is keyed which allows it to be correctly installed in only one position.

5. Align the key of the top cap (2) with key hole in support arm pivot (3). Then secure top cap (2) on support arm pivot (3) by tightening three captive screws (1), making sure not to overtighten screws and crack the top cap.. Make sure wiring (6) is tucked up above light block as much as possible and does not hang down into path of light.
6. The light is now ready for use.

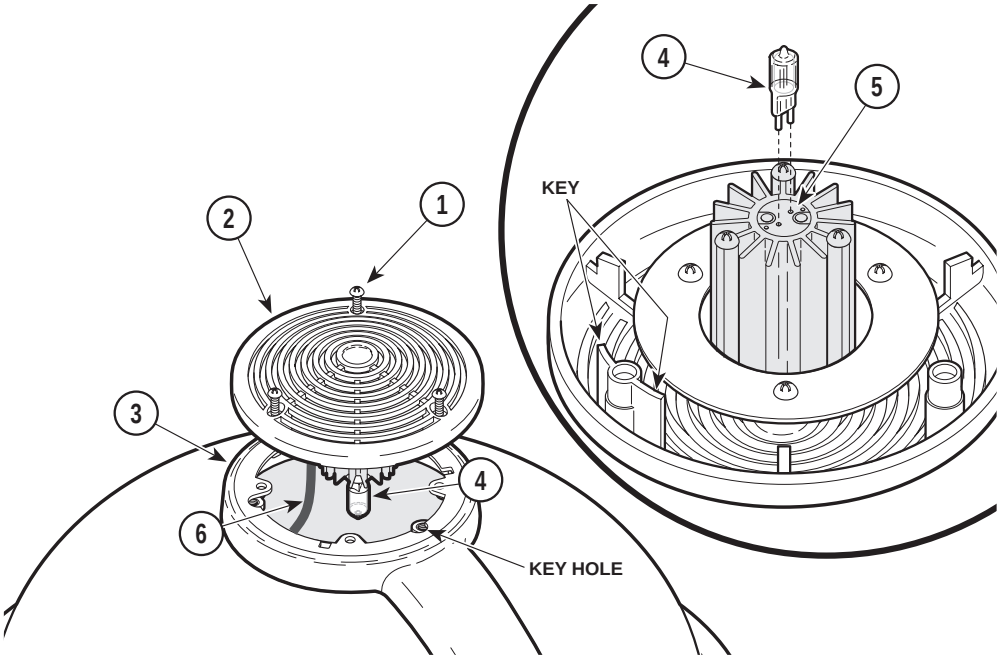


FIGURE 4. BULB REPLACEMENT MA326400

Fuse Replacement Procedure

1. Turn the on / standby switch (A, Figure 3) to standby.
2. Remove four screws (1, Figure 5) and lower ceiling cover (2) from ceiling plate (3).
3. Simultaneously push in on fuse cap (4) and rotate it 1/4 turn in counter-clockwise direction; then pull fuse cap from fuse holder (5).
4. Pull fuse (6) out of fuse cap (4).
5. Inspect fuse for any indication that it has been blown; i.e. burnt look, fuse cord melted through, etc. Discard fuse.

6. Obtain a new fuse of the same voltage rating, amperage rating, and type.
7. Insert one end of the new fuse (6) into the fuse cap (4).
8. Simultaneously push fuse cap (4) into fuse holder (5) and rotate it 1/4 turn in clockwise direction to secure it.
9. Position ceiling cover (2) on ceiling plate (3) and secure with four screws (1).

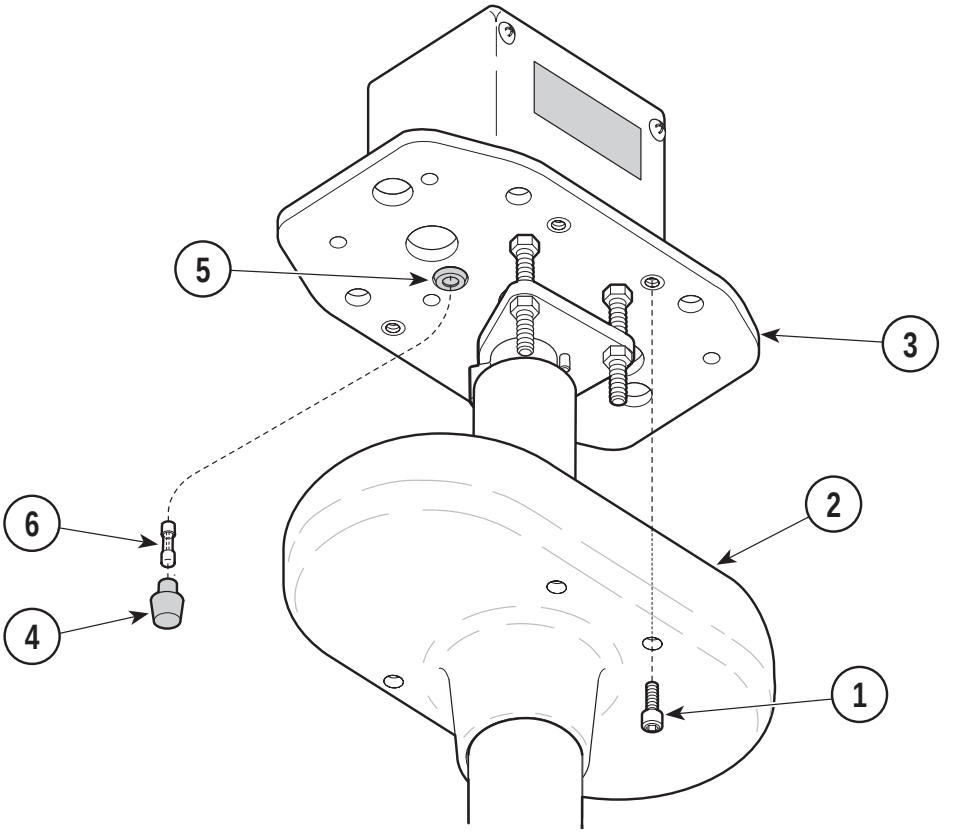


FIGURE 5. FUSE REPLACEMENT MA326500

Ball Pivot Tension Adjustment Procedure

1. Remove screw (1, Figure 6) and slide ball pivot sleeve (2) up out of way.
2. Rotate cross tube (3) until adjustment hole (4) appears in the adjustment window opening.

NOTE

There are three settings which the ball pivot cam (5) can be set for: light tension, medium tension, or stiff tension (see Figure 6). These settings may be changed according to the operator's preference.

3. Insert screwdriver, into adjustment hole (4). Then, using the screwdriver, rotate ball pivot cam (5) to the desired tension setting.

4. Remove the screwdriver and move the cross tube (3) about the ball pivot joint in a circular motion and up and down motion to ensure the setting is the one desired. Move the cross tube (3) to a horizontal position and release it. The cross tube should not drift in any direction. If it does, a higher tension setting is required or the cross tube counterbalance needs adjusted (see counterbalance adjustment in Installation manual or Service and Parts Manual). Repeat steps 3 and 4 until the desired tension adjustment is achieved with no drifting of the cross tube.

5. Slide ball pivot sleeve (2) down into position and secure with screw (1).

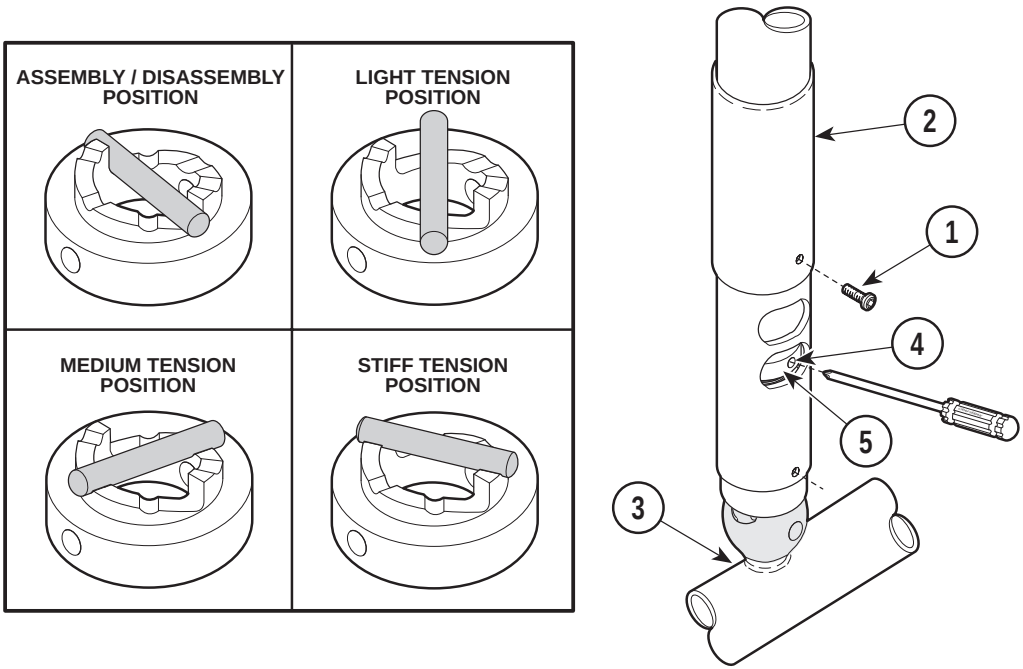


FIGURE 6. BALL PIVOT TENSION ADJUSTMENT MA326600

Preventive Maintenance Schedule

The following preventive maintenance schedule should be followed. If and when problems are detected, refer to the troubleshooting section of this manual.

FREQUENCY	ACTIVITY
semiannually	Inspect rotation of lighthead. Make sure the lighthead rotates freely, without noise, and has 180° of rotation at lamp tube connection. Make sure the lighthead stays positioned at any point (without drifting) with respect to the lamp tube. See Figure 3.
semiannually	Inspect the rotation of the lamp tube, cross tube, and down tube. Make sure the arm assemblies rotate freely and without noise. Make sure the arm assemblies don't drift at any point in their range of motion. The lamp tube should have 540° of rotation at cross tube connection. The cross tube should have 580° of rotation at down tube connection and should also have a vertical range of motion from -35° to +35°. The down tube should have 580° of rotation at ceiling mount connection. See Figure 3.
semiannually	Turn light on. Rotate lighthead, lamp tube, cross tube, and down tube while observing lighthead. Lighthead should not intermittently flicker or stop illuminating while joints are being rotated.
semiannually	Check for excessive joint rotation (more than 540° or 580° of rotation) The physical hard stops for an axis may be broken.
semiannually	Inspect faceplate and inside of lighthead for indications of broken material or other signs of damage. ***If damage to any part of lighthead is evident, do not continue to use lighthead. Using lighthead with a broken IR filter could result in tissue burns to patients.***
semiannually	Inspect lighthead for excessive dust or grime buildup in lighthead interior. Do not attempt to clean or disinfect interior; instead call an authorized dealer or service technician.

Cleaning and Disinfecting

CAUTION **EQUIPMENT ALERT**

When cleaning or disinfecting the light, remove power from the light, allow optical unit to cool, and do not touch glass portion of bulb or inner components of lighthead with bare hand. Clean EXTERNAL SURFACES ONLY (arm assemblies and lighthead). Prevent fluids from leaking into interior or onto electrical contacts. DO NOT ATTEMPT to clean or disinfect interior; instead call an authorized dealer or service technician.

EQUIPMENT ALERT

Use only quaternary disinfectants to disinfect light. Staining, pitting, discoloration, or softening could occur if phenolic, iodophor, or glutaraldehyde-based disinfectant is used on plastic surfaces of the lighthead. Also, use of alcohol or aerosol spray cleaner/disinfectant containing substantial amounts of alcohol in the formula can damage the faceplate.

External Cleaning Procedures

For general cleaning, use a mild detergent and water solution. Wring excess solution from sponge or cloth before wiping.

According to your Facility's Procedure

1. Clean faceplate with an antistatic acrylic cleaning solution using a soft, clean cloth. Do not use alcohol or abrasive compounds of faceplate.
2. Wipe external surface of arm assemblies and lighthead with mild detergent and water solution.
3. Rinse all external surfaces with a soft cloth and clear water, wringing excess from cloth before wiping.
4. Wipe all external surfaces dry.

External Disinfecting Procedure

According to your Facility's Procedure

1. Use only quaternary disinfectants to disinfect light. Staining, pitting, discoloration, or softening could occur if phenolic, iodophor, or glutaral-dehyde-based disinfectant is used on plastic surfaces of the lighthead. Also, use of alcohol or aerosol spray cleaner/disinfectant containing substantial amounts of alcohol in the formula can damage the faceplate.
2. Wring excess solution from cloth.

3. Using soft cloth, wipe all external surfaces of arm assemblies and lighthead.
4. Do not rinse or dry external surfaces. Allow disinfectant solution to air dry.

Handle Sterilization

- Follow sterilization instructions of sterilizer manufacturer.

CALLING FOR SERVICE

If you have a problem that you can't solve, have the information on the inside front cover of this manual completed and available and call:

1-800-Midmark (1-800-643-6275); 8:00 AM until 5:00 PM (Eastern Standard time in the U.S.); Monday thru Friday, except for standard U.S. holidays.

SPECIFICATIONS

Model 355

Beam diameter @ 36 inches: ..... 8" (defined by 20% of peak illumination)

Bulb: ..... (Qty:1) - 100 W halogen lamp

Color temperature: 3,200K

Diameter of lighthead: ..... 17"

Focal length: ..... 36"

Illumination: ..... 4,000 fc, 43,000 lux

Power requirement: ..... 120 VAC, 1.25 amps, single phase

Power to lights: ..... 11.2 VAC, 8.5 amps

Reach of arm assemblies: ..... 48" maximum (from centerline of down tube to center of lighthead)

Rotation of lighthead: ..... 180º rotation at lamp tube connection

Rotation of lamp tube: ..... 540º rotation at cross tube connection

Rotation of cross tube: ..... 580º rotation at down tube connection

Vertical movement of cross tube: .. -35º to +35º vertical movement

Rotation of down tube: ..... 580º rotation at ceiling plate connection

Weight of 8 ft (2.44 m) single light assembly: ..... 54 lbs. (24.5 kgs.)

Weight of 9 ft (2.74 m) single light assembly: ..... 55 lbs. (24.9 kgs.)

Weight of 8 ft (2.44 m) dual light assembly: ..... 100 lbs. (45.3 kgs.)

Weight of 9 ft (2.74 m) dual light assembly: ..... 102 lbs. (46.3 kgs.)

Height of 8 ft (2.44 m) light assembly: ..... 50.0 in. to 76.0 in. (127.0 cm to 193.0 cm)

Height of 9 ft (2.74 m) light assembly: ..... 52.0 in. to 78.0 in. (132.3 cm to 198.1 cm)

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LIMITED WARRANTY

SCOPE OF WARRANTY

Midmark Corporation (“Midmark”) warrants to the original purchaser its new Alternate Care products and components (except for components not warranted under “Exclusions”) manufactured by Midmark to be free from defects in material and workmanship under normal use and service. Midmark’s obligation under this warranty is limited to the repair or replacement, at Midmark’s option, of the parts or the products the defects of which are reported to Midmark within the applicable warranty period and which, upon examination by Midmark, prove to be defective.

APPLICABLE WARRANTY PERIOD

The applicable warranty period, measured from the date of delivery to the original user, shall be one (1) year for all warranted products and components.

EXCLUSIONS

This warranty does not cover and Midmark shall not be liable for the following: (1) repairs and replacements because of misuse, abuse, negligence, alteration, accident, freight damage, or tampering; (2) products which are not installed, used, and properly cleaned as required in the Midmark “Installation” and or “Installation / Operation Manual for this applicable product. (3) products considered to be of a consumable nature; (4) accessories or parts not manufactured by Midmark; (5) charges by anyone for adjustments, repairs, replacement parts, installation, or other work performed upon or in connection with such products which is not expressly authorized in writing in advance by Midmark.

EXCLUSIVE REMEDY

Midmark’s only obligation under this warranty is the repair or replacement of defective parts. Midmark shall not be liable for any direct, special, indirect, incidental, exemplary, or consequential damages or delay, including, but not limited to, damages for loss of profits or loss of use.

NO AUTHORIZATION

No person or firm is authorized to create for Midmark any other obligation or liability in connection with the products.

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